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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,249	08/15/2003	Chih Chieh Yeh	MXIC 1553-3 (P920080-2)	1545
22470	7590	01/27/2005	EXAMINER	
HAYNES BEFFEL & WOLFELD LLP P O BOX 366 HALF MOON BAY, CA 94019			OWENS, DOUGLAS W	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/642,249

Applicant(s)

YEH ET AL.

SM

Examiner

Douglas W. Owens

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9 and 21-57 is/are rejected.
- 7) ☒ Claim(s) 8, 10-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>8/15/03; 11/13/03; 1/20/04; 4/23/04</u>                                   | 6) <input type="checkbox"/> Other: ____                                     |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 21 – 57 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 requires that the reference signal corresponds with the number of program cycles. The scope of the claim is vague, because the manner in which the reference signal corresponds with the program cycles is not known. It is clear that there is some type of relationship between the reference signal and program cycle, but it is not possible to determine how they relate to each other. Claims 22 and 23 have similar limitations.

Claim 30 requires that a property is above or below a reference level. The claim requires that a property must be set above or below a reference level. The scope of the claim cannot be determined since it is not known what the property is, nor is it known what the reference level refers too. It is common in the art to refer to a reference voltage, but a property of a device cannot refer to a voltage. The claim appears to be comparing two completely different elements. Claims 40 and 49 recite similar limitations.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 – 4, 6 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication No. 2004/0031853 to Peng.

Regarding claim 1, Peng teaches a method for programming a memory cell (fig. 4, for example) comprising a first electrode (301), a second electrode (406) and an inter-electrode layer of material (312), comprising:

applying stress to the inter-electrode layer to induce a progressive change in a property of the inter-electrode layer (Paragraph [0041], lines 6 – 10; Paragraph [0071], lines 5 – 11).

Regarding claim 2, Peng teaches a method, wherein the inter-electrode layer comprises a dielectric, and the property is resistance (Paragraph [0083]).

Regarding claim 3, Peng teaches a method, wherein the inter-electrode layer comprises an ultra-thin layer (Paragraph [0033]).

Regarding claims 4 and 6, Peng teaches a method, wherein the inter-electrode layer of material comprises silicon dioxide having a thickness of 50 Angstroms or less (paragraph [0033]), which includes the range of less than 20 and 15 Angstroms.

Regarding claim 9, Peng teaches a method including, after applying said stress to cause the progressive change, generating a signal indicating the property (Fig. 12, for example; I(A)) and comparing the signal with a reference signal (zero current) to verify programming of desired data.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peng as applied to claim 1 above, and further in view of US Patent Application Publication No. 2004/0137688 to Chang et al.

Peng teaches a method, wherein the inter-electrode layer of material comprises a layer having a thickness of 50 Angstroms or less (paragraph [0033]), which includes the range of less than 20 and 15 Angstroms. Peng further teaches that the inter-electrode layer may comprise any type of dielectric (Paragraph [0043]). Peng does not teach that the inter-electrode material comprises silicon oxynitride. Chang et al. teach an inter-electrode layer comprising silicon oxynitride (paragraph [0036], lines 4 – 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Chang et al. into the device taught by Peng, since it is desirable to use materials that are known to be reliable for the intended use.

***Allowable Subject Matter***

7. Claims 8 and 10 – 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W. Owens whose telephone number is 571-272-1662. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Douglas W Owens  
Examiner  
Art Unit 2811